

**METHOD OF PASSIVATING AN OXIDE SURFACE
SUBJECTED TO A CONDUCTIVE MATERIAL ANNEAL**

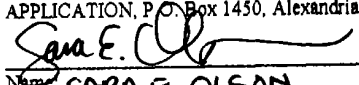
Abstract of the Disclosure

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A method of preventing formation of titanium oxide within a semiconductor device structure during a high temperature treatment of the device structure includes forming a passivation layer to preclude formation of titanium oxide at a titanium/oxide interface of a semiconductor device structure. The method includes providing a substrate assembly including at least an oxide region and forming a layer of titanium over a surface of the oxide region. The oxide region surface is treated with a plasma comprising nitrogen prior to forming the titanium layer so as to form a passivation layer upon which the titanium layer is formed. A thermal treatment is performed on the substrate assembly with the passivation layer substantially inhibiting diffusion of oxygen from the oxide layer during the thermal treatment of the substrate assembly. Generally, the passivation layer comprises $\text{Si}_x\text{O}_y\text{N}_z$.

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 Name: SARA E. OLSON